STR-414L

AEP Model

FM-AM PROGRAM RECEIVER

SPECIFICATIONS

GENERAL

Power Requirements: 120 V, 220 V or 240 V ac adjustable, 50 Hz

Power Consumption: 250 W

Dimensions: Approx. 410 (w) x 145 (h) x 375 (d) mm
16 (w) x 5 ¾ (h) x 14 ¾ (d) inches
including projecting parts and controls

Weight: Approx. 9.1 kg, 20 lb 1 oz (net)
Approx. 11.2 kg, 24 lb 12 oz (in shipping carton)

FM SECTION

Frequency Range: 87.5 – 108 MHz

Antenna: 300 Ω balanced
75 Ω unbalanced

Intermediate Frequency: 10.7 MHz

Sensitivity at 50dB Quieting: 3.5 μV (10.7 dB) (MONO)
45 μV (33 dB) (STEREO)

Sensitivity at 46dB Quieting: (at 40 kHz deviation) 4 μV (12 dB) (MONO)
50 μV (34 dB) (STEREO)

Usable Sensitivity: (at 40 kHz deviation) 1.8 μV (5 dB), IHF
1.6 μV (4 dB), S/N=26 dB

S/N Ratio: 75 dB (MONO)
70 dB (STEREO)

Harmonic Distortion: At 100 Hz
0.15 % (MONO)
0.3 % (STEREO)
At 1 kHz
0.15 % (MONO)
0.3 % (STEREO)
At 10 kHz
0.2 % (MONO)
0.5 % (STEREO)

IM Distortion: 0.15 % (MONO)
0.3 % (STEREO)

Separation: 35 dB at 100 Hz
45 dB at 1 kHz
35 dB at 10 kHz

Frequency Response: 40 – 12,500 Hz $^{+0.5}_{-1.0}$ dB
30 – 15,000 Hz $^{+0.5}_{-2.0}$ dB

– Continued on page 2 –

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY SHADING AND MARK ⚠ ON THE SCHEMATIC DIAGRAMS, EXPLODED VIEWS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

SONY

SERVICE MANUAL

Selectivity: 60 dB (400 kHz)
40 dB (300 kHz, S/N=26 dB, 40 kHz deviation)

Capture Ratio: 1.0 dB

AM Suppression Ratio: 54 dB

Image Response Ratio: 45 dB

IF Response Ratio: 90 dB

Spurious Response Ratio: 75 dB

RF Intermodulation: 60 dB

Muting Threshold: Approx. 5 μV

SW/MW/LW SECTION

Frequency Range: SW: 5.8 – 15.8 MHz
MW: 530 – 1,605 kHz
LW: 150 – 350 kHz

Antenna: SW/MW: External antenna terminal
Attached antenna wire
LW: Built-in Ferrite-rod antenna
External antenna terminal

Intermediate Frequency: 468 kHz

Usable Sensitivity: SW: 30 μV (29.5 dB), external antenna (10 MHz)
MW: 100 μV (40 dB), external antenna (1,000 kHz)
LW: 500 μV/m (53.8 dB/m), built-in antenna (250 kHz)
100 μV (40 dB), external antenna (250 kHz)

S/N Ratio: SW/MW: 52 dB (5 mV)
LW: 52 dB (50 mV/m)

Harmonic Distortion: SW/MW: 0.3 % (5 mV, 400 Hz)
LW: 0.3 % (50 mV/m, 400 Hz)

Selectivity: 28 dB (9 kHz)
30 dB (10 kHz)

AUDIO AMPLIFIER SECTION

Continuous RMS Power Output: Less than 0.3 % THD, both channels driven simultaneously
At 20 – 20,000 Hz
40 W + 40 W (8 Ω)
At 1 kHz
45 W + 45 W (8 Ω)
According to DIN 45500
40 W + 40 W (8 Ω)
40 W + 40 W (4 Ω)

Dynamic Power Output: IHF constant power supply method
130 W (8 Ω)

Power Bandwidth: 10 – 40,000 Hz, IHF

Damping Factor: 30 at 1 kHz (8 Ω)

Harmonic Distortion: Less than 0.3 % at rated output (8 Ω)
Less than 0.7 % at rated output (4 Ω)
Less than 0.1 % at 1 W output

IM Distortion: (60 Hz : 7 kHz = 4 : 1) Less than 0.3 % at rated output
Less than 0.1 % at 1 W output

Residual Noise: Less than 0.08 μW (at 8 Ω)

Frequency Response: PHONO:
RIAA equalization curve ± 0.5 dB
TAPE:
10 – 50,000 Hz $^{+1\ dB}_{-3\ dB}$

Inputs:

	Sensitivity	Impedance	S/N	Weighting network
PHONO	2.5 mV (–50 dB)	50 kΩ	80 dB	A
TAPE 1, 2	150 mV (–14.5 dB)	100 kΩ	95 dB	A

Measured with rated output power into 8 Ω loads (both channels driven simultaneously) at 1 kHz.

Outputs: (with rated input)

	Voltage	Impedance
REC OUT 1, 2	150 mV (–14.5 dB)	10 kΩ

Headphones: Accepts all low or high impedance headphones

Speaker: 4 – 16 Ω speakers are suitable.

Tone Controls: BASS: ±9 dB at 100 Hz
TREBLE: ±7 dB at 10 kHz

Loudness Control: (att. 30 dB) +8 dB at 100 Hz
+3 dB at 10 kHz

High Filter: 6 dB/oct. above 7.5 kHz

SECTION 1
OUTLINE

1-1. CIRCUIT DESCRIPTION (See Fig. 1)

Program Sensor

The FM or LW band can be changed automatically through the optical detection by the following procedures;

1 Set the FUNCTION switch (S1) to band selector position (center position).
2 Then, Set the band selector switch (S3) to PROGRAM SENSOR position.
3 Match the dial pointer to the desired station marker. (See Fig. 2)
4 The FM or LW band changes automatically.

1) When the pointer matches only with the FM station marker:

a) The light of IC301 (Photo Interrupter) is intercepted by the marker, bias voltage is applied to the base of Q303 through R305, and Q303 is turned on.
b) The collecter voltage of Q303 reduces and D203 is turned on.
c) D203 is conducted, B+ voltage through R217 is decreased.
d) D201 is opened, B+ voltage is not supplied to the terminal (23) of IC201.
e) FM circuit operates (The terminal (23) of IC201 serves as a switch).

Note: When B+ voltage is applied to the terminal (23) of IC201 through R217, R216 and D201, the receiver is in LW mode.

f) At the same time, PL905 (FM indicator lamp) lights because of Q304 operating.

2) When the pointer matches only with the LW station marker:

a) As the light of IC301 is not intercepted, Q303 and D203 are turned off. As a result, B+ voltage is applied to the terminal (23) of IC201 through R217 and R216. On the other hand, the light of IC302 is intercepted by the LW station marker.
b) Q306 and Q305 are turned on.
c) B+ voltage is applied to L208 (LW oscillator coil).
d) LW circuit operates. When Q305 is on, PL906 (LW indicator lamp) simultaneously lights.

3) When the pointer matches simultaneously with both the FM and LW station markers:

a) Q303 and Q304 are turned on by intercepting the light of IC301. On the other hand, the light of IC302 is also intercepted and the bias voltage is applied to the base of Q306, but because the collector voltage of Q304 is high, D304 is turned off. The emitter voltage of Q306 rises and B+ voltage is not applied to L208 (LW oscillator coil) and PL906. Consequently, only the FM station signal is received.

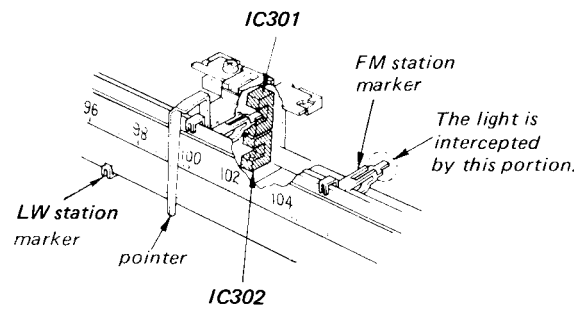


Fig. 2

Q302 and 301

Q302 operates to improve the rise time of PL905 (FM indicator lamp) or PL906 (LW indicator lamp) when tuning the receiver, and at the same time Q302 switches Q301. Q301 serves as a high-speed-muting switch which is turned on or off as soon as the station signal is tuned or detuned.

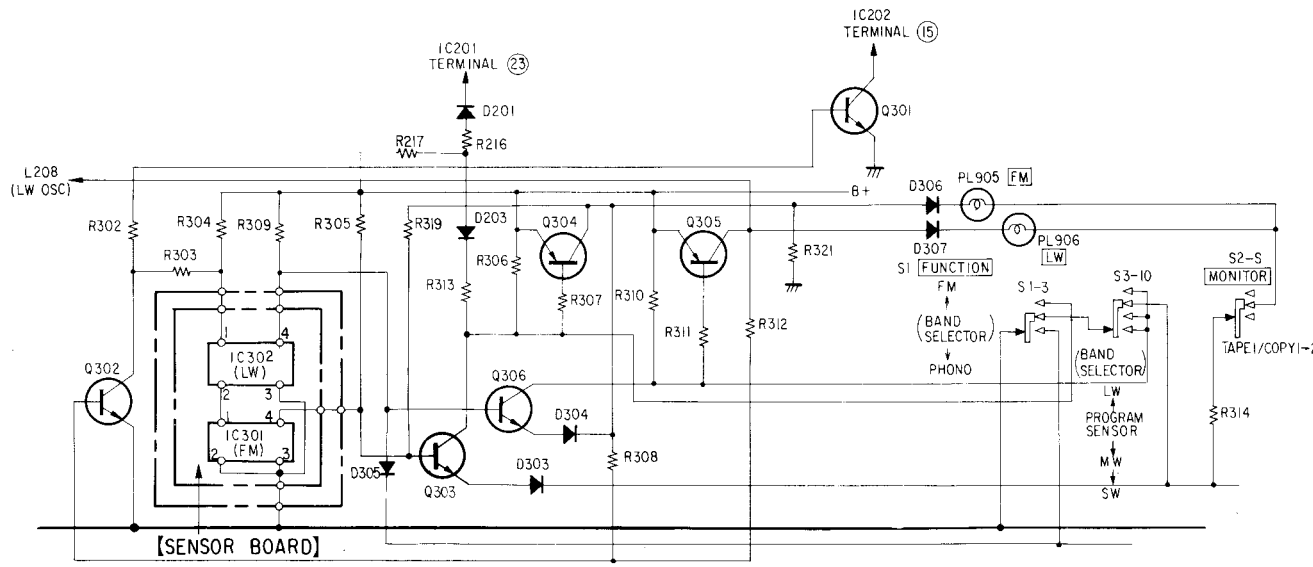


Fig. 1

IC201 (CX168), IC202 (CX178)

These two ICs form a system. Both of them are bipolar-linear-ICs. CX168 integrates 343 elements and CX178 integrates 260 elements. They include many functions and are improved upon the degree of integration now available as a linear-ICs for tuner use. They have high performance in FM reception and form a muting system having an FM muting attenuation of 90dB. In addition, because a muting circuit is newly employed in the AM circuit not only is there high performance in FM reception but AM station signal can be received with fine tone quality and sensitivity as with FM broadcasting station. As an additional function, they operate for FM/AM continuous station selection, FM/AM signal-strength meter output, FM/AM muting output switching and enforced AGC at FM reception.

CX168 Main Function

<FM>
- IF Amplifier
- Quadrature detector
- Signal-strength Meter Output
- Muting Signal Output
- AFC Output for Converter
- Multipath Signal Output
- Bandpass Control Circuit

<AM>
- RF Attenuator
- Mixer
- Oscillator
- IF Amplifier and AGC
- AM Detector
- Signal-Strength Meter Output
- Signal Generator for AM Muting

<General>
- Regulator
- FM/AM Switching
- Regulator Output

CX178 Main Function

<FM Stereo Demodulator>
- FM Stereo Demodulator
- Phase Detector
- Stereo Indicating Circuit
- VCO
- VCO ON/OFF Circuit

<General>
- Muting Gate
- Regulator
- Muting Canceler Circuit
- Pop-noise Canceler
- Hysteresis Circuit

Photo Interrupter (IC301, 302)

The terminals (1) and (2) of the photo interrupter operate as the light emitting diode. On the other hand, the terminals (3) and (4) operate as the photo detector. When the photo detector receives the light as shown in Fig. 3, the terminal between terminals (3) and (4) is a low-impedance. When light is intercepted by the marker, as shown in Fig. 4, it becomes high-impedance.

When the photo detector receives the light

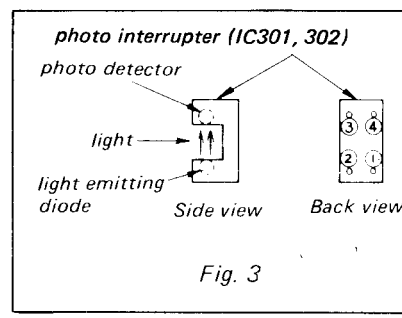


Fig. 3

When light is intercepted

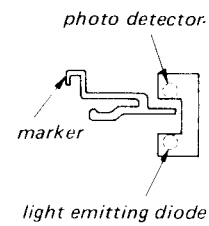
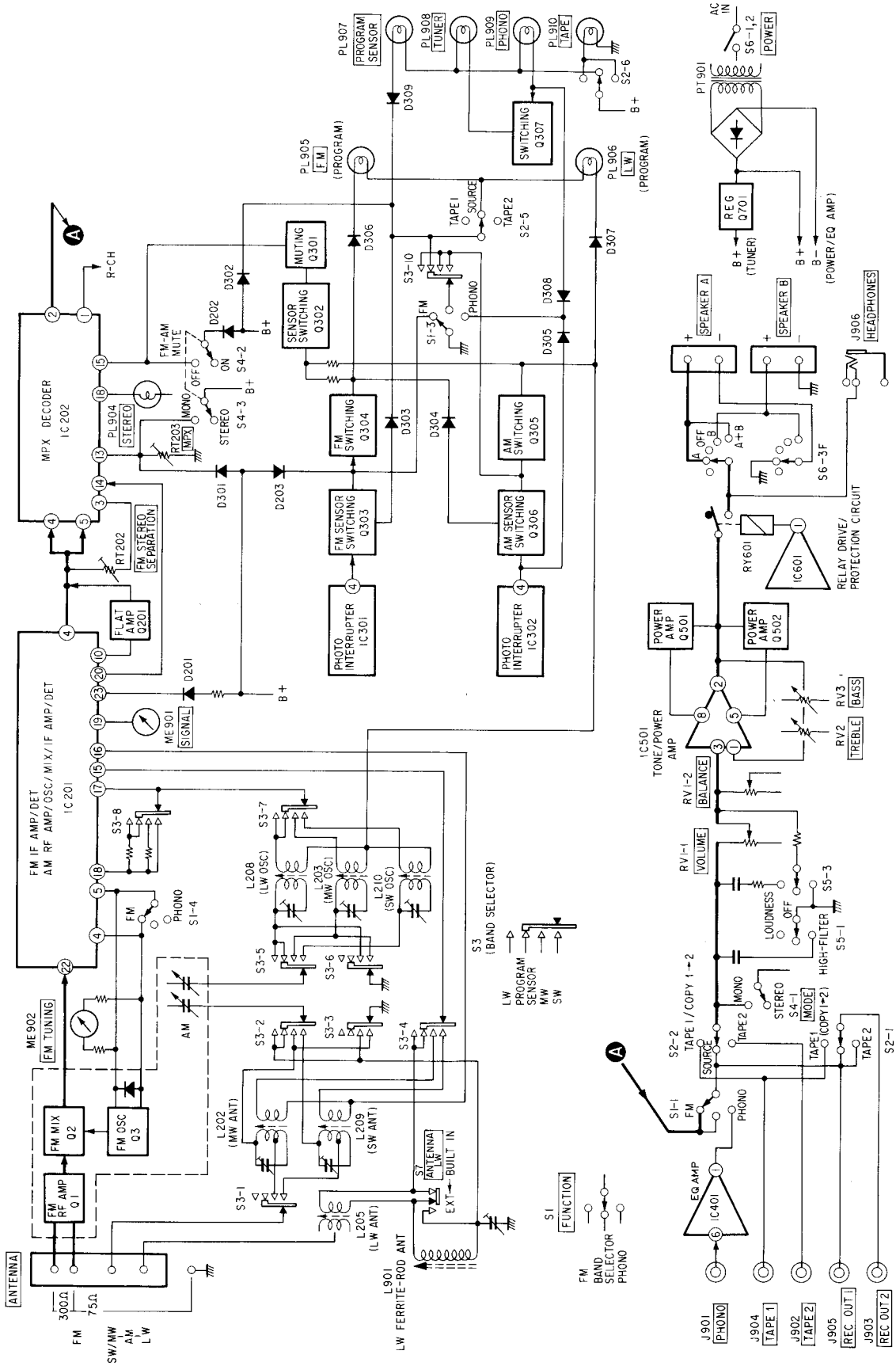


Fig. 4

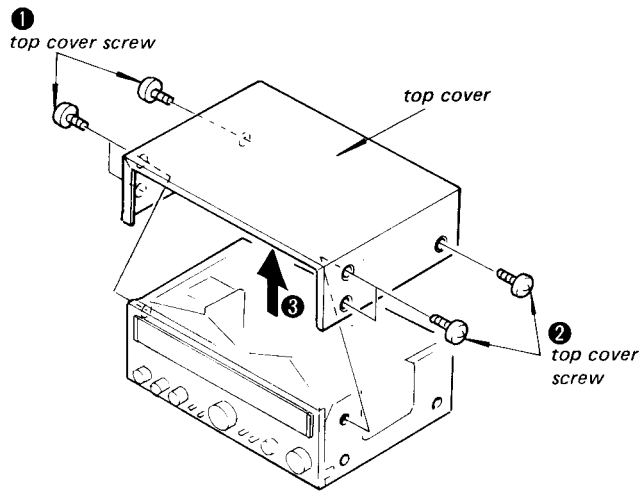
1-2. BLOCK DIAGRAM



SECTION 2
DISASSEMBLY

- Follow the disassembly procedure in the numerical order given.

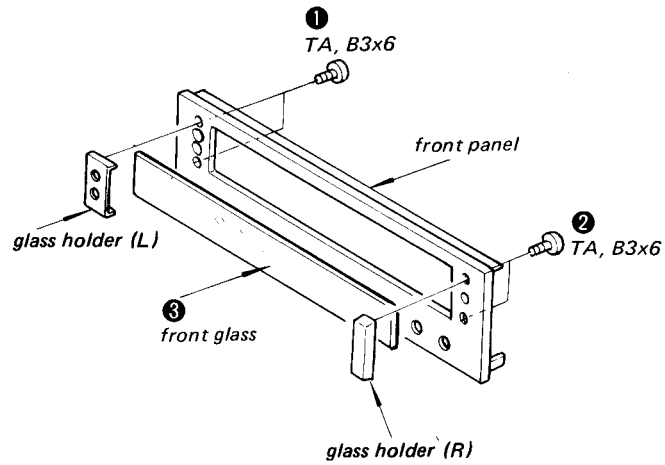
TOP COVER REMOVAL



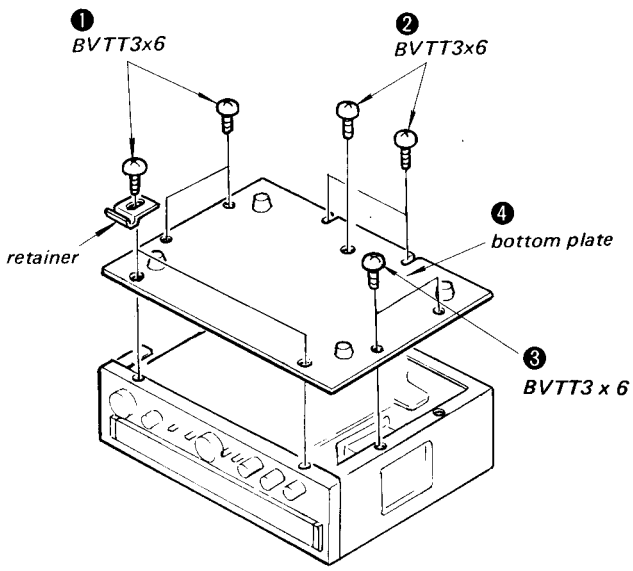
DIAL CORD STRINGING

• See page 8

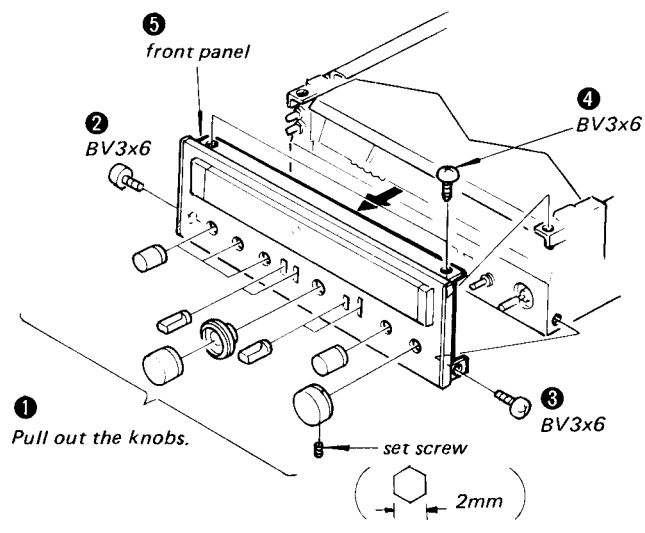
FRONT GLASS REMOVAL



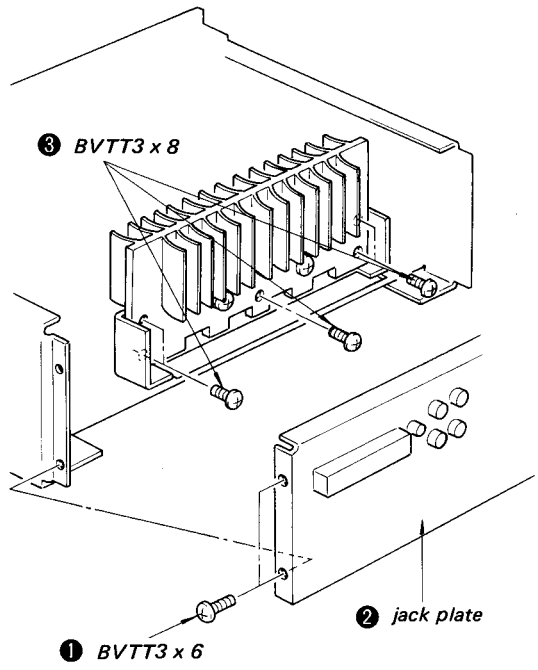
BOTTOM PLATE REMOVAL



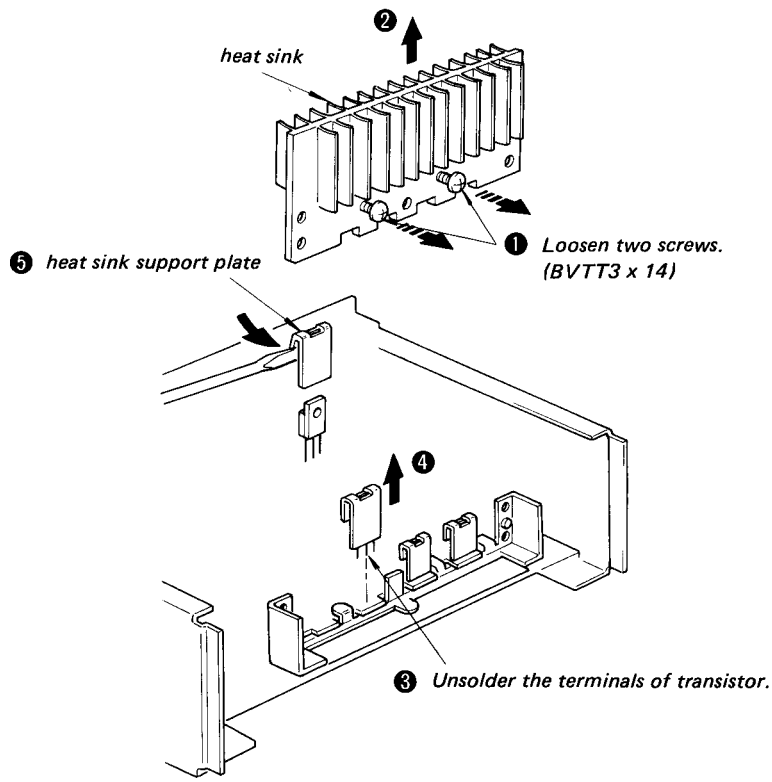
FRONT PANEL REMOVAL



POWER TRANSISTOR (Q501, 502, 551, 552) REPLACEMENT (1)

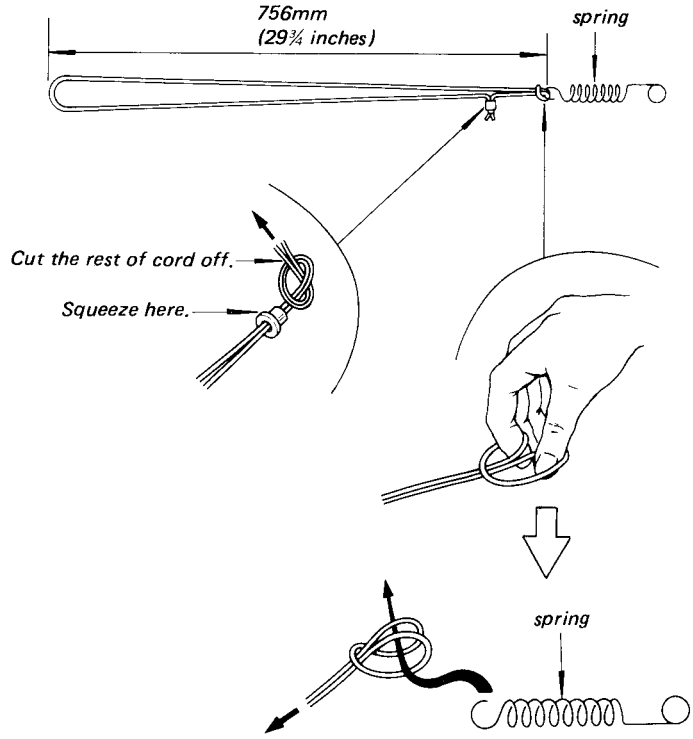


POWER TRANSISTOR (Q501, 502, 551, 552) REPLACEMENT (2)

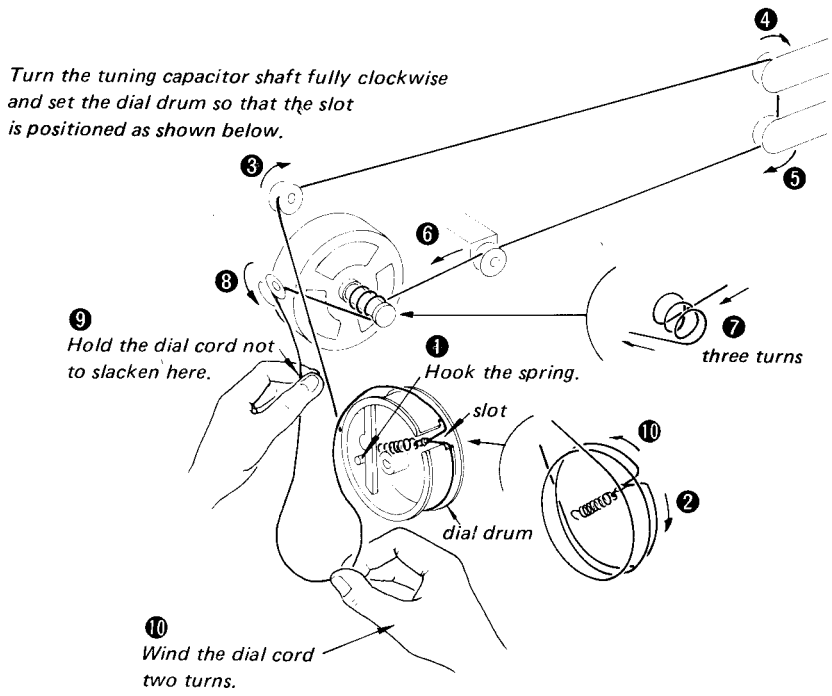


DIAL CORD STRINGING

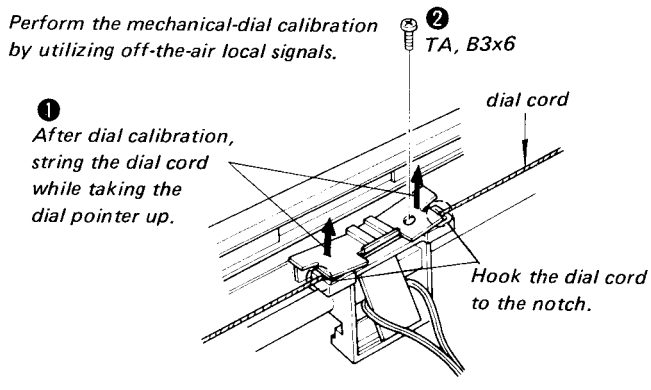
1) Preparation



2) Stringing



3) Dial Pointer Installation


Perform the mechanical-dial calibration by utilizing off-the-air local signals.
❷
TA, B3x6
dial cord
❶
After dial calibration, string the dial cord while taking the dial pointer up.
Hook the dial cord to the notch.

SECTION 3
ELECTRICAL ADJUSTMENTS

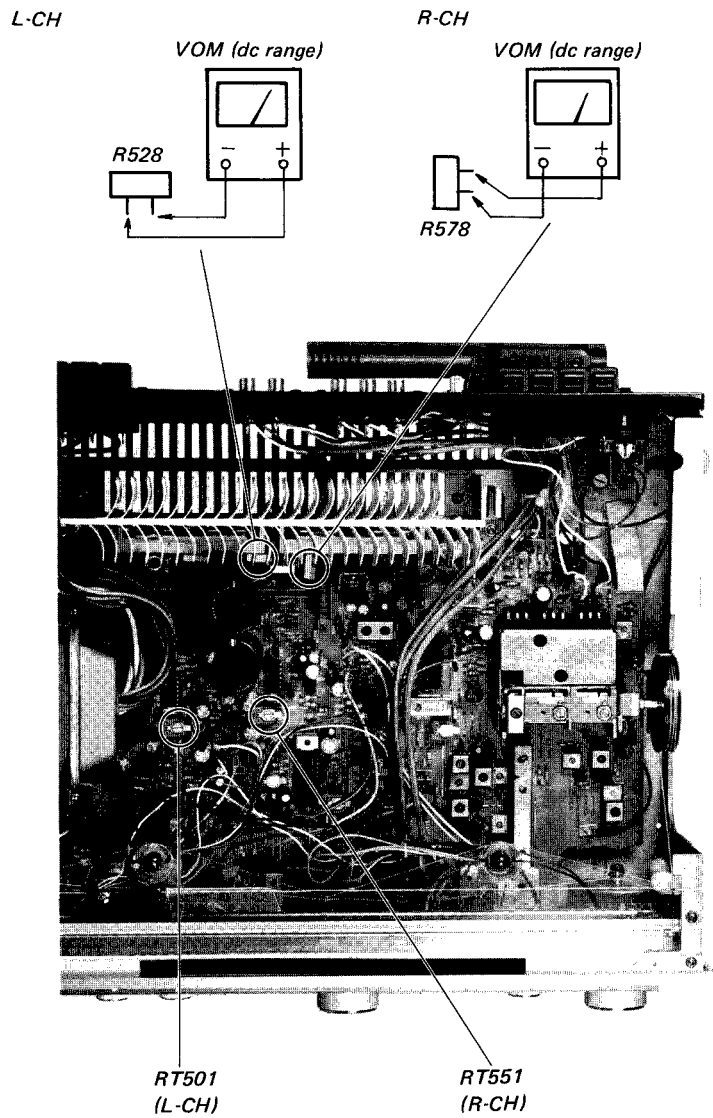
DC BIAS ADJUSTMENT

Setup:

1. Detune the set.
2. Perform this adjustment one minute or more after turning the power switch on.

Procedure:

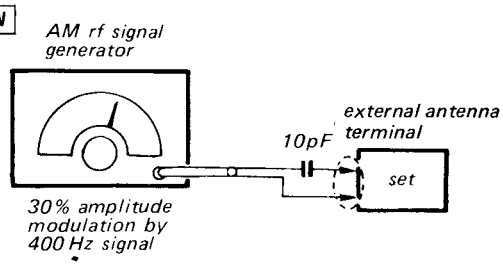
1. Adjust RT501 (L-CH) and RT551 (R-CH) for a 9mV dc on the VOM.

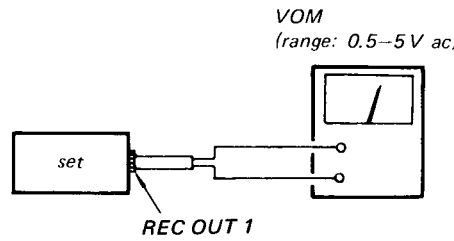


SW, MW SECTION

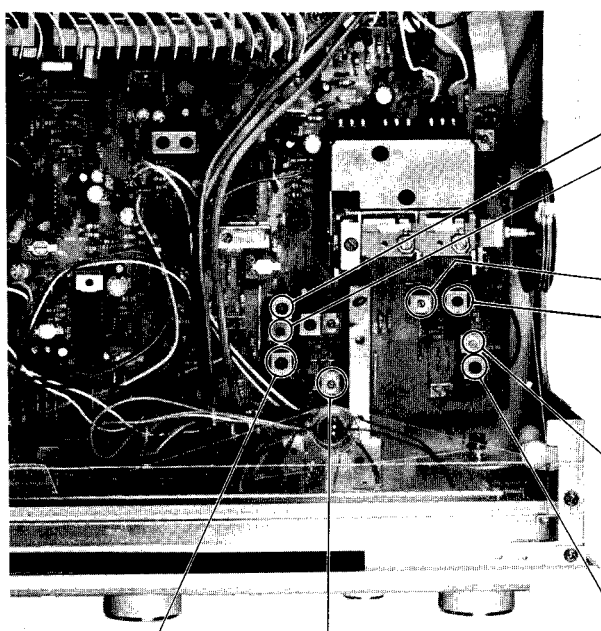
Setting: FUNCTION switch: (Band Selector)
(Band Selector) : SW, MW

MW, SW





- Repeat the procedures in each adjustment several times, and the frequency coverage and tracking adjustments should be finally done by the trimmer capacitors.



MW FREQUENCY COVERAGE ADJUSTMENT	
Adjust for a maximum reading on VOM.	
L203	*520 kHz*
CT204	*1680 kHz*

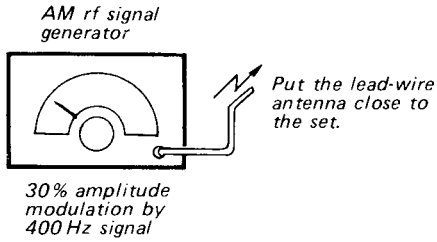
MW TRACKING ADJUSTMENT	
Adjust for a maximum reading on VOM.	
CT203	*1400 kHz*
L202	*600 kHz*

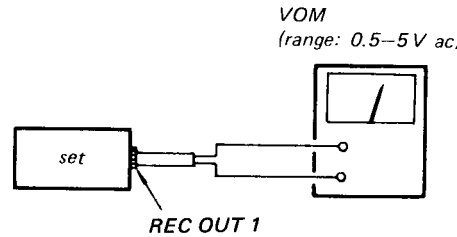
L210	*CT206*
5.5 MHz	*16.1 MHz*
Adjust for a maximum reading on VOM.	
SW FREQUENCY COVERAGE ADJUSTMENT	

L209	*CT205*
6 MHz	*15 MHz*
Adjust for a maximum reading on VOM.	
SW TRACKING ADJUSTMENT	

LW SECTION

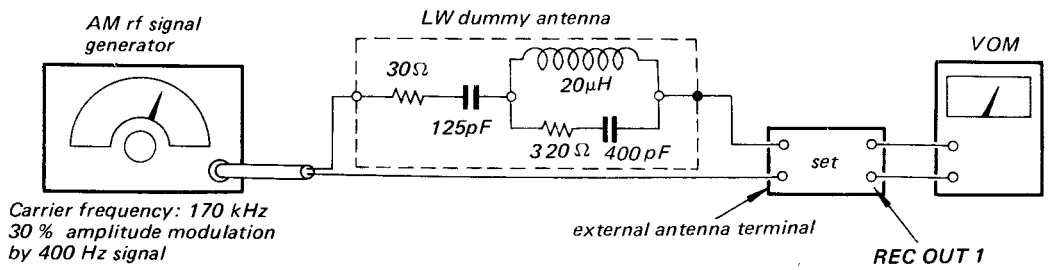
Setting: FUNCTION switch: (Band Selector)
(Band Selector): LW
ANTENNA LW switch: BUILT IN



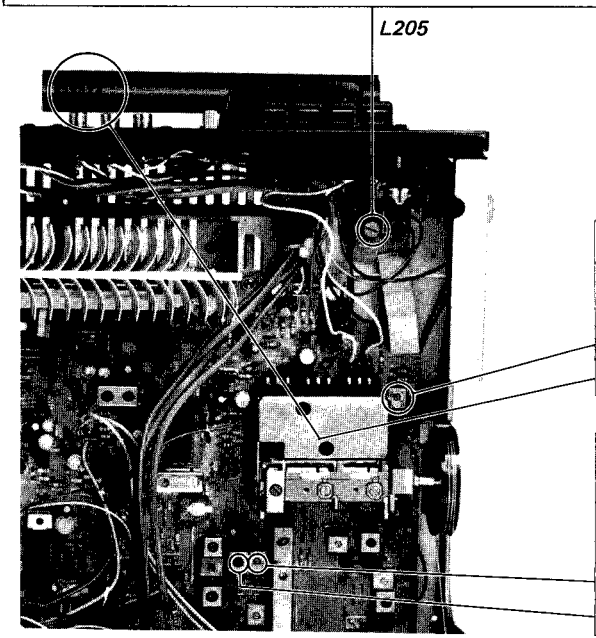


- Repeat the procedures in each adjustment several times, and the frequency coverage and tracking adjustments should be finally done by the trimmer capacitors.

LW EXT ANTENNA COIL ADJUSTMENT



1. Set the ANTENNA LW switch to EXT position.
2. Tune the set to 170 kHz and adjust L205 for a maximum reading on VOM.

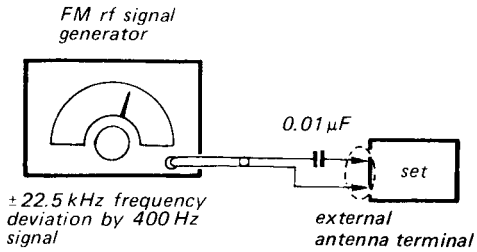


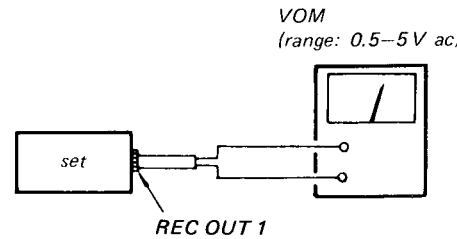
LW TRACKING ADJUSTMENT	
Adjust for a maximum reading on VOM.	
CT201	*310 kHz*
L901	*170 kHz*

LW FREQUENCY COVERAGE ADJUSTMENT	
Adjust for a maximum reading on VOM.	
CT202	*365 kHz*
L208	*145 kHz*

FM SECTION

Setting: FUNCTION switch: FM

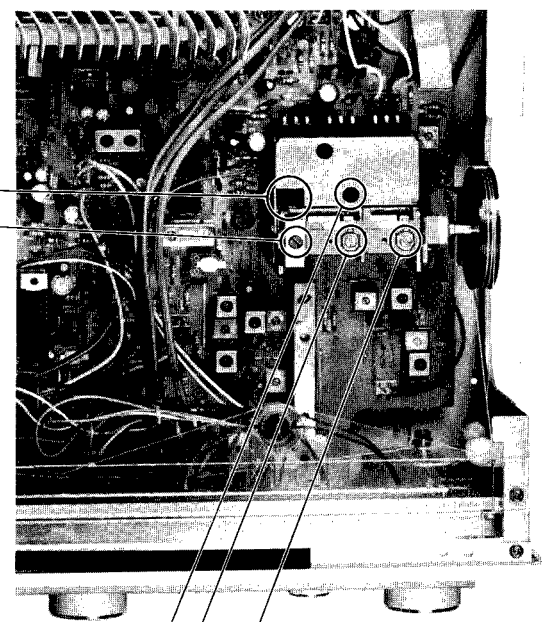




- Repeat the procedures in each adjustment several times, and the frequency coverage and tracking adjustments should be finally done by the trimmer capacitors.

FM FREQUENCY COVERAGE ADJUSTMENT	
Adjust for a maximum reading on VOM.	
87.1 MHz (87.5 MHz)	*L3*
108.5 MHz (108 MHz)	*CT3*

( ): in West Germany

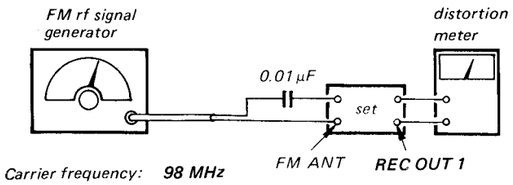


87.1 MHz (87.5 MHz)	*L2*
108.5 MHz (108 MHz)	*CT2*
	CT1
Adjust for a maximum reading on VOM.	
FM TRACKING ADJUSTMENT	

( ): in West Germany

FM DISCRIMINATOR ALIGNMENT 2

Procedure:



Carrier frequency: ***98 MHz***
Output level: *1mV (60 dB)*
Modulation: *400 Hz, 75 kHz deviation (100%)*

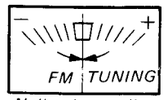
1. Set MODE switch to MONO.
2. Turn the core (secondary side) of IFT201 for a minimum distortion reading on the distortion meter.

IFT201
(secondary side: black)

FM DISCRIMINATOR ALIGNMENT 1

Procedure:

1. Detune the set.
2. Turn the core (primary side) of IFT201 for null-point reading on the FM TUNING meter.

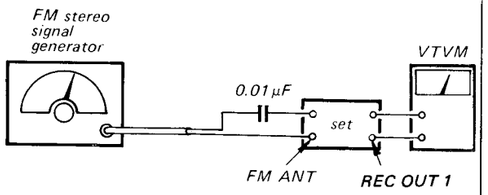


Null-point reading

IFT201
(primary side: blue)

FM STEREO SEPARATION ADJUSTMENT

Procedure:



Carrier frequency: *98 MHz*
Output level: *1 mV (60 dB)*
Mode: *Stereo*
Modulation:
Audio (400 Hz): 67.5 kHz deviation (90%)
Pilot (19 kHz): 7.5 kHz deviation (10%)

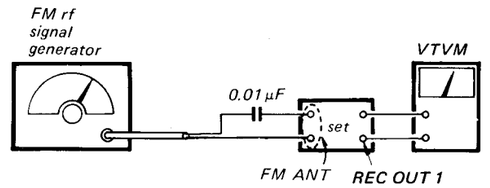
MODE switch: STEREO

FM stereo signal generator output channel	VTVM connection	VTVM reading
L-CH	L-CH	Ⓐ
R-CH	L-CH	Ⓑ Adjust RT202 for minimum reading.
R-CH	R-CH	Ⓒ
L-CH	R-CH	Ⓓ Adjust RT202 for minimum reading.

L-CH Stereo separation: Ⓐ - Ⓑ
R-CH Stereo separation: Ⓒ – Ⓓ

The separations of both channels should be equal.

FM IF ALIGNMENT



FM Signal Generator Setting:

Carrier frequency: *98 MHz*
Modulation: *400 Hz, 75 kHz deviation (100%)*
Output level: *12 µV (21.5dB)*

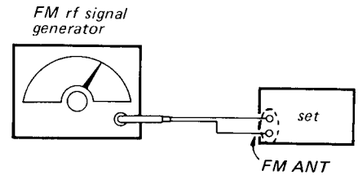
Procedure:

Tune the set to 98 MHz and adjust IFT1 for a maximum reading on the VTVM.

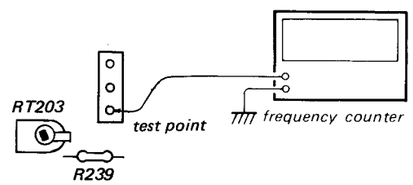
MPX ADJUSTMENT

A) Regular Method

Procedure:



Carrier frequency: *98 MHz*
Modulation: *no modulation*
Output level: *1 mV (60 dB)*

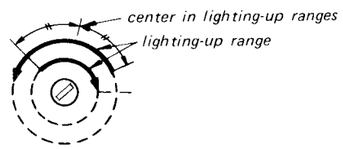


1. Tune the set to 98 MHz.
2. Adjust RT203 for 76 kHz ±100Hz on the counter.

B) Simple Method

Procedure:

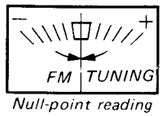
1. Tune the set to the FM stereo broadcasting signal.
2. Turn RT203 clockwise or counterclockwise and memorize the lighting-up range of STEREO lamp.
3. Secure RT203 at the center in lighting-up range of both turns as shown below.



FM DISCRIMINATOR ALIGNMENT 1

Procedure:

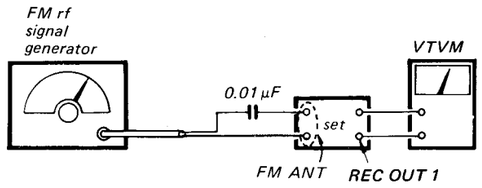
1. Detune the set.
2. Turn the core (primary side) of IFT201 for null-point reading on the FM TUNING meter.



Null-point reading

IFT201
(primary side: blue)

FM IF ALIGNMENT



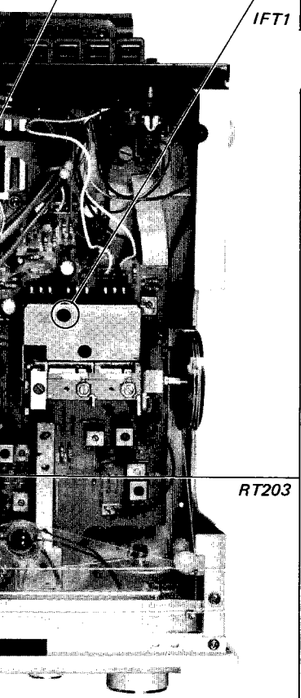
FM Signal Generator Setting:

Carrier frequency:	*98 MHz*
Modulation:	*400 Hz, 75 kHz deviation (100%)*
Output level:	*12 μV (21.5dB)*

Procedure:

Tune the set to 98 MHz and adjust IFT1 for a maximum reading on the VTVM.

IFT1

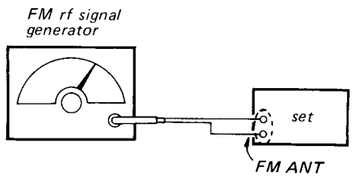


RT203

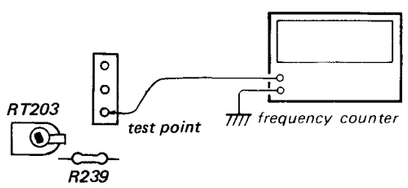
MPX ADJUSTMENT

A) Regular Method

Procedure:



Carrier frequency: *98 MHz*
Modulation: *no modulation*
Output level: *1 mV (60 dB)*

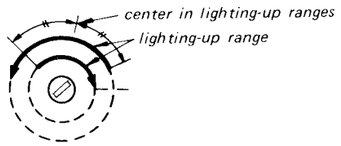


1. Tune the set to 98 MHz.
2. Adjust RT203 for 76 kHz ±100Hz on the counter.

B) Simple Method

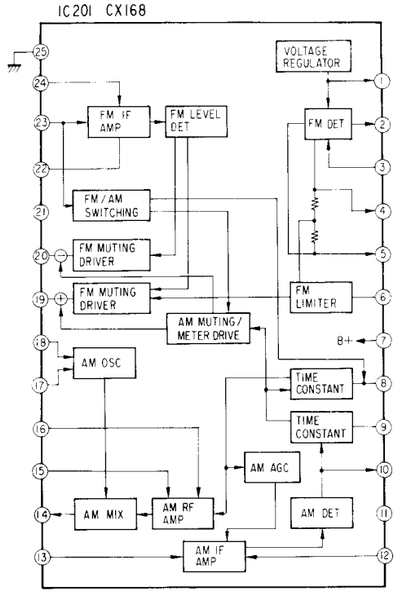
Procedure:

1. Tune the set to the FM stereo broadcasting signal.
2. Turn RT203 clockwise or counterclockwise and memorize the lighting-up range of STEREO lamp.
3. Secure RT203 at the center in lighting-up range of both turns as shown below.

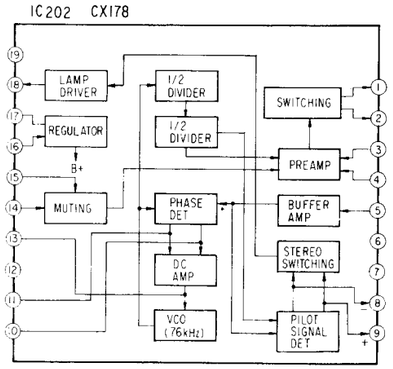


• IC Block Diagrams

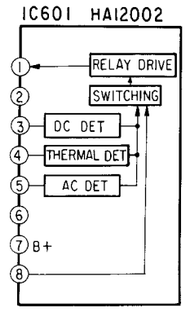
IC201 CX168



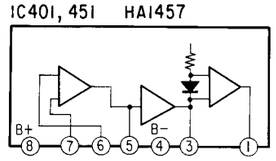
IC202 CX178



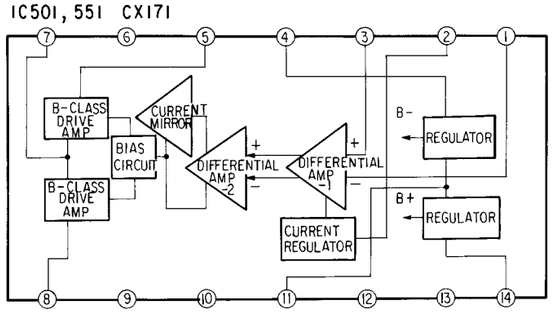
IC601 HAI2002



IC401, 451 HAI457



IC501, 551 CX171



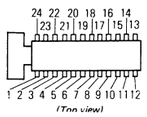
SECTION 4
DIAGRAMS

4-1. MOUNTING DIAGRAM

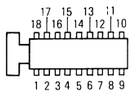
– Conductor Side –

- IC Block Diagram: See page 15.
- **Replacement Semiconductors**
  For replacement, use semiconductors except in ( ).

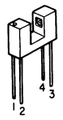
IC201: CX168



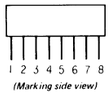
IC202: CX178



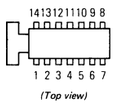
IC301, 302: SPI201



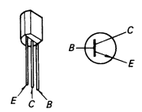
IC401, 451: HA1457
IC601: HA12002



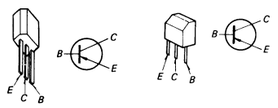
IC501, 551: CX171



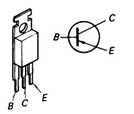
Q201
Q301–303 : 2SC1364 (2SC945)
Q306, 307



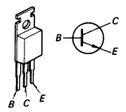
Q304, 305: 2SA678 **(2SA844)**



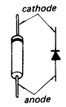
Q501, 551: 2SA771



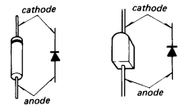
Q502, 552: 2SC1986C (2SC1986)
Q701: 2SC1173



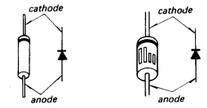
D201–203
D301–309
D502, 504, 506–511
D552, 554, 556–561
D602 : 1S1555
D501, 551 : 1T22AM (1T22A)
D503, 505, D553, 555 : 1S2076A



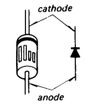
D601: 10E2 **(RA1Z)**



D701–704: 10E2 **(SIB01-02)**

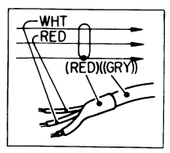


D705, 706: EQB01-22 (EQA01-22R)
D707: EQB01-16 (EQA01-16R)



Note:

- ⊣⊢ : indicates side identified with part number.
- ■ : part mounted on the conductor side.
- Color code of sleeving over the end of the jacket.

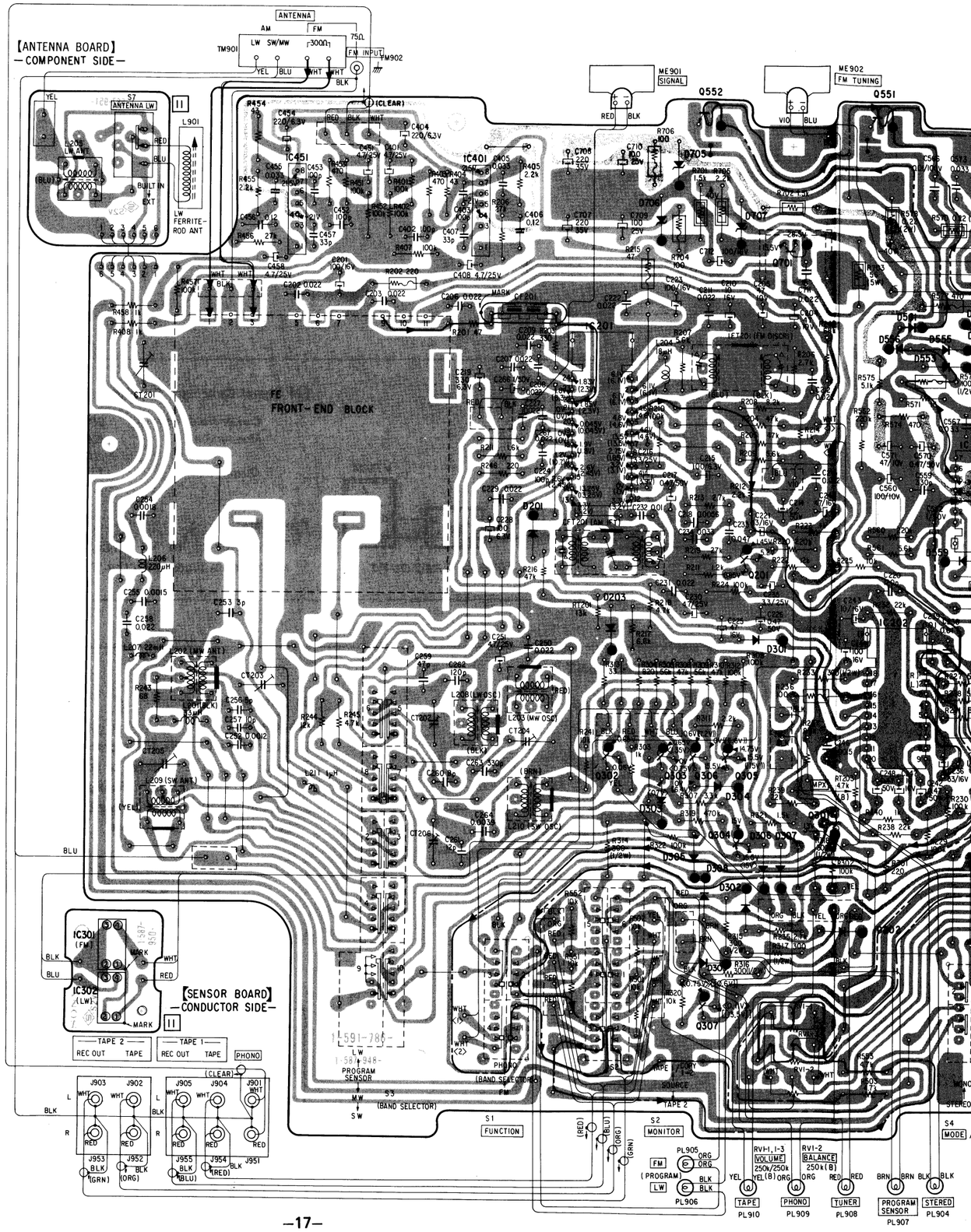


- ▬▬ : B+ pattern.
- ▒▒▒ : B– pattern.
- Signal Path
  —·—→ : L-CH
  —··—→ : R-CH

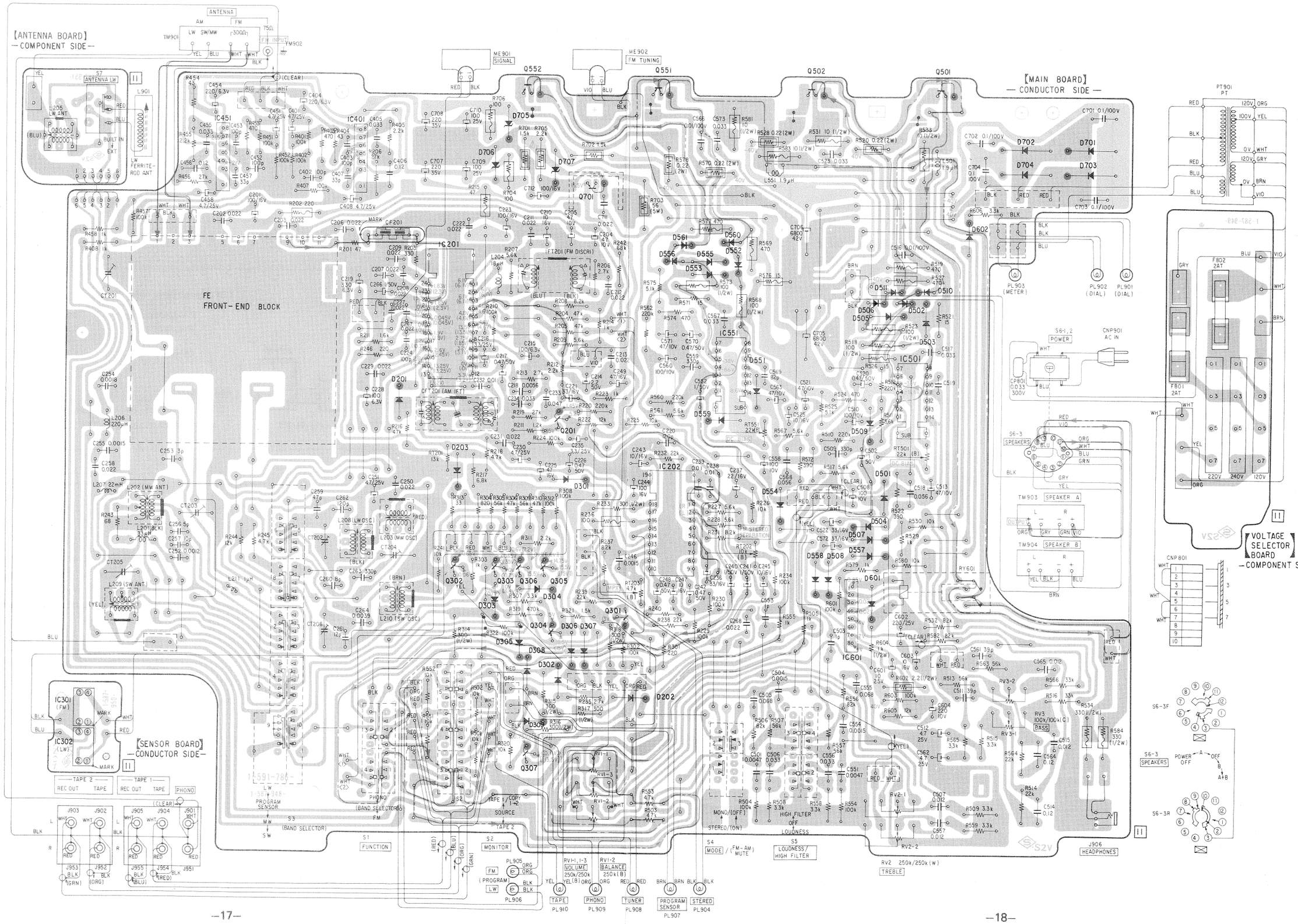
- Voltages of IC202.

TERMINAL No.	FM no mark	FM STEREO ( )	FM MUTING ON	AM MUTING ON	TERMINAL No.	FM no mark	FM STEREO ( )	FM MUTING ON	AM MUTING ON
1	7.8V	7.8V	7.8V	7.8V	10	2.8V	2.8V	2.8V	2.8V
2	7.7V	7.7V	7.7V	7.7V	11	2.8V	2.8V	2.8V	2.8V
3	4V	4V	4V	4V	12	0V	0V	0V	0V
4	4V	4V	4V	4V	13	4.8V	2.6V	2.6V	6.8V
5	4V	4V	4V	4V	14	0.05V	5V	1V	0.05V
6	0V	0V	0V	0V	15	13V	2.1V	0.04V	0.04V
7	0V	0V	0V	0V	16	12.5V	12.5V	13.5V	13.5V
8	2.8V	2.75V	2.8V	2.8V	17	4V	4V	4V	4V
9	2.8V	2.75V	2.8V	2.8V	18	15.5V	0.25V	15.5V	15.5V

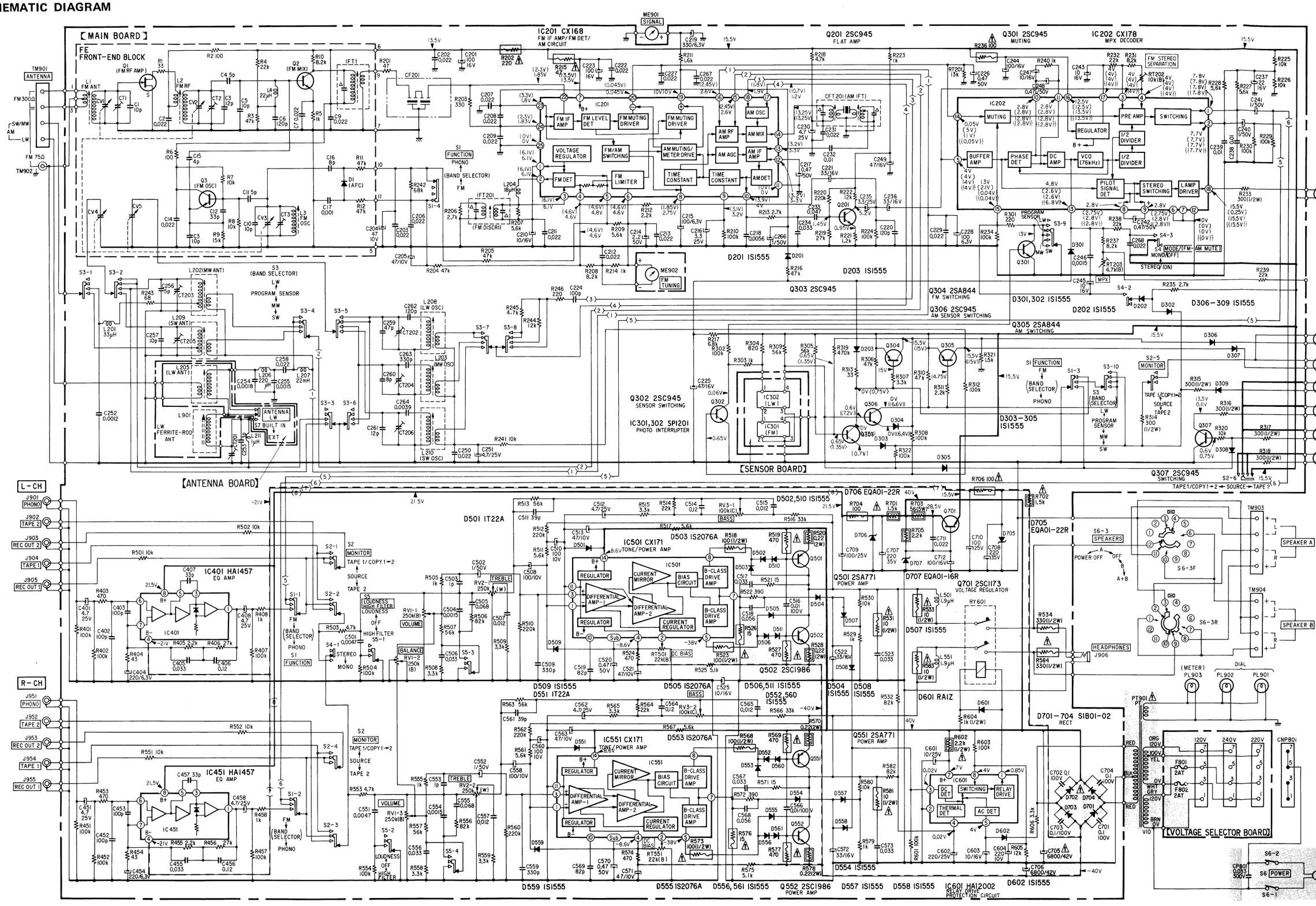
Q, IC	D
552,551 502,501	
IC451,IC401	705
	702,701 704,703
	707
	706
701	602
IC201	561,560
	552
	556,555
	553
	511,510 506,502 505, 503
IC551 IC501	551
	201
	559
201	509
	203
IC202	501
	301
	554
	504
	507
	557
	558,508
	601
302,303 306,305	304
301	303
304	306,307
	305
IC601	308
	302
	202
IC301	
IC302	309
307	

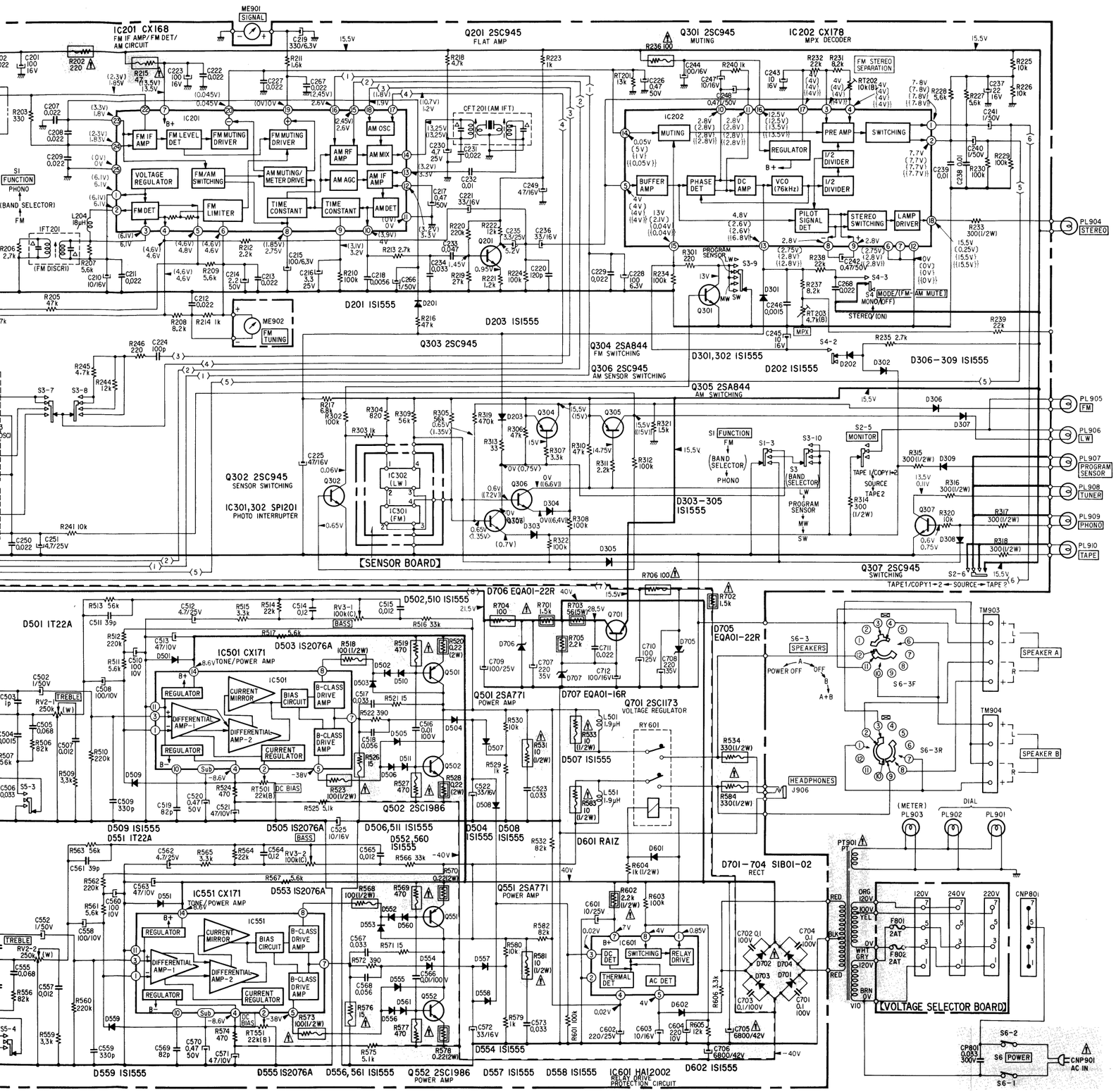


Q , IC	D
552,551 502,501	
IC451,IC401	705
	702,701 704,703
	707
	706
701	602
	561,560
IC201	552
	556,555
	553
	511,510
	506,502
	505, 503
IC551 IC501	
	551
	201
	559
201	509
	203
IC202	
	501
	301
	554
	504
	507
	557
	558,508
	601
302,303 306,305	304
301	
	303
304	306,307
	305
IC601	308
	302
	202
IC301	
IC302	309
307	



4-2. SCHEMATIC DIAGRAM





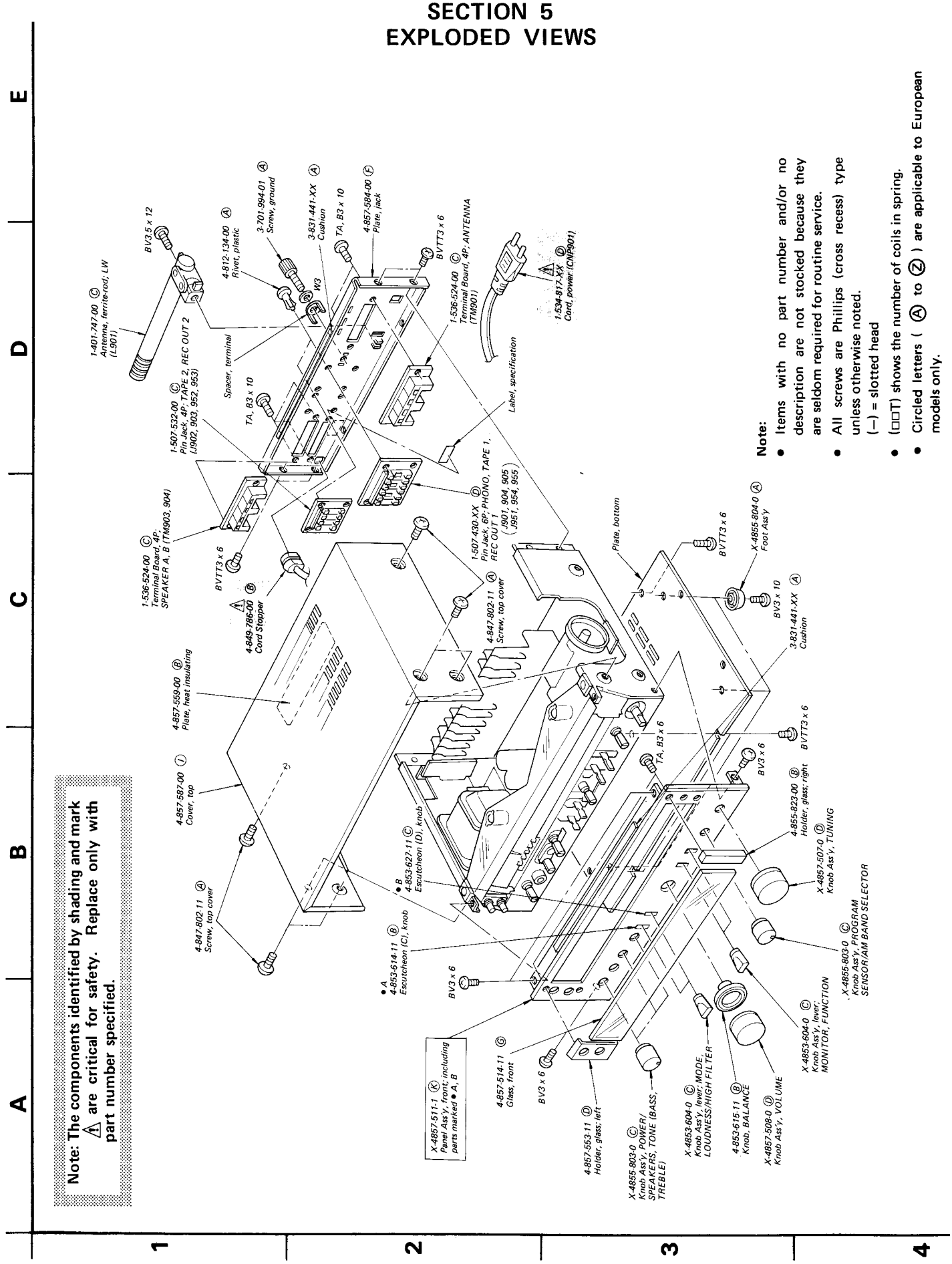
Note:

- All capacitors are in μF unless otherwise noted. pF : μμF 50WV or less are not indicated except for electrolytics.
- All resistors are in ohms, ¼W unless otherwise noted. kΩ : 1000Ω; MΩ : 1000kΩ
- ⏦ : fusible resistor.
- ▭ : nonflammable resistor.
- ——— : B+ bus.
- — — — : B− bus.
- ▭ : panel designation.
- ▭ : adjustment for repair.
- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken under no-signal (detuned) conditions with a VOM (20 kΩ/V).
  ( ) : AM ≪ ≫ : TUNER PROGRAM
  [ ] : FM STEREO (( )) : TAPE, PHONO
  < > : PROGRAM FM { } : FM MUTING ON
  (( )) : PROGRAM LW {{ }} AM MUTING ON
  no mark: FM MONO
- Voltage variations may be noted due to normal production tolerances.
- Switch

Ref. No.	Switch	Position
S1	FUNCTION	BAND SELECTOR
S2	MONITOR	SOURCE
S3	Band Selector	PROGRAM SENSOR
S4	MODE/(FM-AM MUTE)	STEREO/(ON)
S5	LOUDNESS/HIGH FILTER	OFF
S6	POWER/SPEAKERS	(ON)/A
S7	ANTENNA LW	BUILT IN

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

SECTION 5
EXPLODED VIEWS

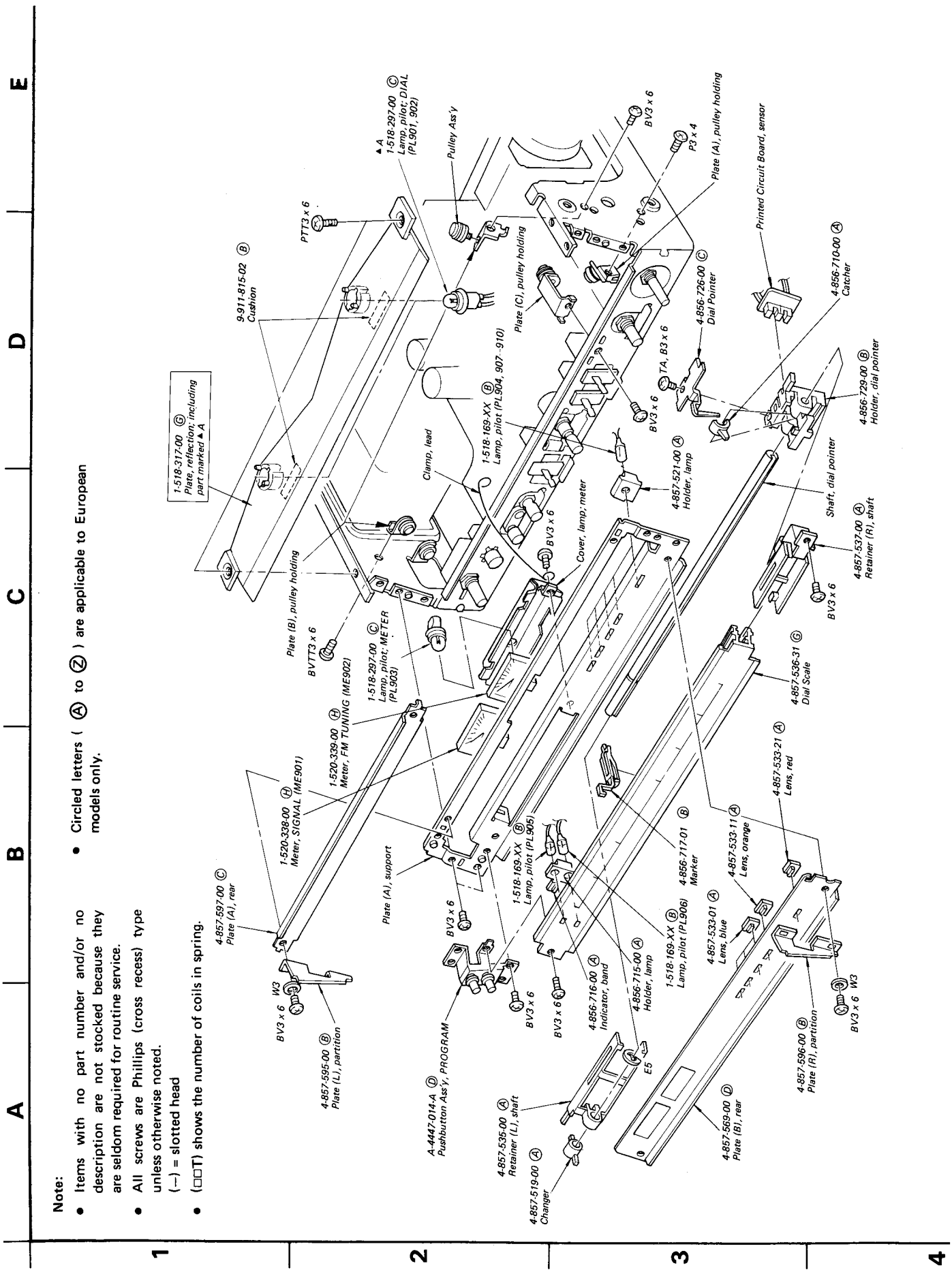

A
B
C
D
E
1
2
3
4
Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.
1-401-747-00 Ⓒ Antenna, ferrite-rod; LW (L901)
BV3.5 x 12
4-812-134-00 Ⓐ Rivet, plastic
3-701-994-01 Ⓐ Screw, ground
3-831-441-XX Ⓐ Cushion
TA, B3 x 10
4-857-584-00 Ⓔ Plate, jack
BVTT3 x 6
1-536-524-00 Ⓒ Terminal Board, 4P; ANTENNA (TM901)
1-534-817-XX Ⓓ Cord, power (CNP901)
Spacer, terminal
M3
TA, B3 x 10
1-507-532-00 Ⓒ Pin Jack, 4P; TAPE 2, REC OUT 2 (J902, 903, 952, 953)
Label, specification
1-536-524-00 Ⓒ Terminal Board, 4P; SPEAKER A, B (TM903, 904)
BVTT3 x 6
⚠ 4-849-786-00 Cord Stopper Ⓑ
1-507-430-XX Ⓓ Pin Jack, 6P; PHONO, TAPE 1, REC OUT 1 (J901, 904, 905, J951, 954, 955)
4-847-802-11 Ⓐ Screw, top cover
Plate, bottom
BVTT3 x 6
X-4855-804-0 Ⓐ Foot Ass'y
4-857-559-00 Ⓑ Plate, heat insulating
4-857-587-00 Ⓘ Cover, top
BV3 x 10
3-831-441-XX Ⓐ Cushion
TA, B3 x 6
BV3 x 6
BVTT3 x 6
4-855-823-00 Ⓑ Holder, glass; right
X-4857-507-0 Ⓓ Knob Ass'y, TUNING
• B 4-853-627-11 Ⓒ Escutcheon (D), knob
4-847-802-11 Ⓐ Screw, top cover
• A 4-853-614-11 Ⓑ Escutcheon (C), knob
BV3 x 6
X-4855-803-0 Ⓒ Knob Ass'y, PROGRAM SENSOR/AM BAND SELECTOR
X-4857-511-1 Ⓚ Panel Ass'y, front; including parts marked • A, B
4-857-514-11 Ⓖ Glass, front
BV3 x 6
4-857-553-11 Ⓓ Holder, glass; left
X-4855-803-0 Ⓒ Knob Ass'y, POWER/ SPEAKERS, TONE (BASS, TREBLE)
X-4853-604-0 Ⓒ Knob Ass'y, lever; MODE, LOUDNESS/HIGH FILTER
4-853-615-11 Ⓑ Knob, BALANCE
X-4857-508-0 Ⓓ Knob Ass'y, VOLUME
X-4853-604-0 Ⓒ Knob Ass'y, lever; MONITOR, FUNCTION

Note:

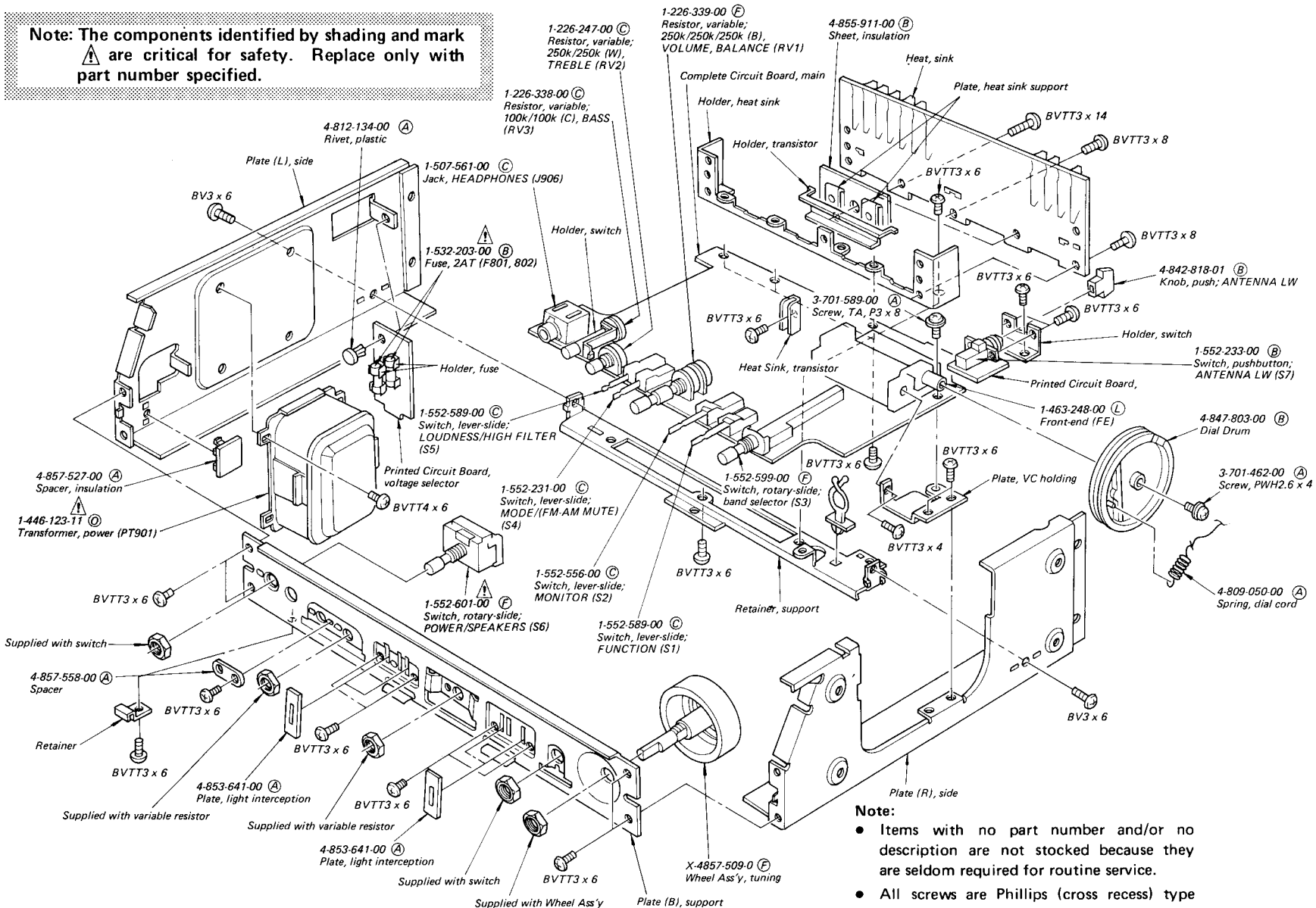
- Items with no part number and/or no description are not stocked because they are seldom required for routine service.
- All screws are Phillips (cross recess) type unless otherwise noted.
  (–) = slotted head
- (□□T) shows the number of coils in spring.
- Circled letters (Ⓐ to Ⓩ) are applicable to European models only.

Note:

- Items with no part number and/or no description are not stocked because they are seldom required for routine service.
- All screws are Phillips (cross recess) type unless otherwise noted.
  (—) = slotted head
- (□□T) shows the number of coils in spring.
- Circled letters (Ⓐ to Ⓩ) are applicable to European models only.



Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.



Note:

- Items with no part number and/or no description are not stocked because they are seldom required for routine service.
- All screws are Phillips (cross recess) type unless otherwise noted.
  (–) = slotted head
- (□□T) shows the number of coils in spring.
- Circled letters (Ⓐ to Ⓩ) are applicable to European models only.

SECTION 6
ELECTRICAL PARTS LIST

• Circled letters (Ⓐ to Ⓩ) are applicable to European models only.

Ref. No.	Part No.		Description
			SEMICONDUCTORS
			Transistors
⇒ Q201	8-729-663-47	Ⓑ	2SC1364
⇒ Q301–303, ⇒ Q306, 307	8-729-663-47	Ⓑ	2SC1364
⇒ Q304, 305	8-727-788-00	Ⓑ	2SA678
Q501, 551	8-729-377-12	Ⓔ	2SA771
⇒ Q502, 552	8-729-308-62	Ⓔ	2SC1986C
Q701	8-729-217-33	Ⓒ	2SC1173
			ICs
IC201	8-751-680-01	Ⓘ	CX168
IC202	8-751-780-00	Ⓖ	CX178
IC301, 302	8-719-902-01	Ⓑ	SPI201
IC401, 451	8-759-314-57	Ⓒ	HA1457
IC501, 551	8-751-710-00	Ⓖ	CX171
IC601	8-759-320-02	Ⓓ	HA12002
			Diodes
D201–203, D301–309	8-719-815-55	Ⓑ	1S1555
⇒ D501, 551	8-719-422-21	Ⓑ	1T22AM
D502, 504, D506–511	8-719-815-55	Ⓑ	1S1555
D552, 554, D556–561	8-719-815-55	Ⓑ	1S1555
D503, 505, D553, 555	8-719-923-76	Ⓑ	1S2076A
⇒ D601	8-719-200-02	Ⓑ	10E2
D602	8-719-815-55	Ⓑ	1S1555
⇒ D701–704	⚠ 8-719-200-02	Ⓑ	10E2
⇒ D705, 706	8-719-931-22	Ⓑ	EQB01-22
⇒ D707	8-719-931-16	Ⓑ	EQB01-16

• ⇒: Due to standardization, interchangeable replacements may be substituted for parts specified in the diagrams.

Ref. No.	Part No.		Description
			COILS
L202	1-401-728-00	Ⓑ	Antenna, MW
L203	1-405-797-00	Ⓑ	Osc, MW
L204	1-407-741-00	Ⓑ	Microinductor, 18μH
L205	1-401-709-00	Ⓒ	Antenna, LW
L207	1-407-210-XX	Ⓐ	Microinductor, 22mH
L208	1-405-813-00	Ⓑ	Osc, LW
L209	1-401-741-00	Ⓑ	Antenna, SW
L210	1-405-812-00	Ⓑ	Osc, SW
L211	1-407-178-XX	Ⓐ	Microinductor, 1μH
L901	1-401-747-00	Ⓒ	Antenna, ferrite-rod; LW
			TRANSFORMERS AND FILTER
CF201	1-527-277-91	Ⓖ	Filter, ceramic
CFT201	1-404-087-00	Ⓓ	AM IFT
IFT201	1-404-011-00	Ⓒ	FM Discriminator
PT901	⚠ 1-446-123-11	Ⓞ	Power

CAPACITORS

All capacitors are in μF and ceramic unless otherwise noted. 50WV or less are not indicated except for electrolytics.
pF : μμF, elect : electrolytic

C201	1-121-415-00	Ⓐ	100	16V	elect
C202, 203	1-101-924-00	Ⓐ	0.022		
C204, 205	1-123-192-00	Ⓐ	47	10V	elect
C206–209	1-101-924-00	Ⓐ	0.022		
C210	1-121-651-00	Ⓐ	10	16V	elect
C211–213	1-101-924-00	Ⓐ	0.022		
C214	1-121-450-00	Ⓐ	2.2	50V	elect
C215	1-121-413-00	Ⓐ	100	6.3V	elect
C216	1-121-392-00	Ⓐ	3.3	25V	elect
C217	1-121-726-00	Ⓐ	0.47	50V	elect

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

- Circled letters (Ⓐ to Ⓩ) are applicable to European models only.

Ref. No.	Part No.	Description		
C218	1-108-355-00	Ⓐ 0.0056		mylar
C219	1-121-751-00	Ⓐ 330	6.3V	elect
C220	1-102-816-00	Ⓐ 120p		
C221	1-121-403-00	Ⓐ 33	16V	elect
C222	1-101-924-00	Ⓐ 0.022		
C223	1-121-415-00	Ⓐ 100	16V	elect
C224	1-102-973-00	Ⓐ 100p		
C225	1-121-409-00	Ⓐ 47	16V	elect
C226	1-121-726-00	Ⓐ 0.47	50V	elect
C227	1-101-924-00	Ⓐ 0.022		
C228	1-121-413-00	Ⓐ 100	6.3V	elect
C229	1-101-924-00	Ⓐ 0.022		
C230	1-121-395-00	Ⓐ 4.7	25V	elect
C231	1-101-924-00	Ⓐ 0.022		
C232	1-101-923-00	Ⓐ 0.01		
C233	1-108-246-00	Ⓐ 0.047		mylar
C234	1-108-244-00	Ⓐ 0.033		mylar
C235	1-121-392-00	Ⓐ 3.3	25V	elect
C236	1-121-403-00	Ⓐ 33	16V	elect
C237	1-121-479-00	Ⓐ 22	16V	elect
C238, 239	1-108-579-00	Ⓐ 0.01		mylar
C240, 241	1-121-391-00	Ⓐ 1	50V	elect
C242	1-121-726-00	Ⓐ 0.47	50V	elect
C243	1-121-651-00	Ⓐ 10	16V	elect
C244	1-121-415-00	Ⓐ 100	16V	elect
C245	1-121-651-00	Ⓐ 10	16V	elect
C246	1-104-081-00	Ⓐ 0.0015		polyethylene
C247	1-121-651-00	Ⓐ 10	16V	elect
C248	1-121-726-00	Ⓐ 0.47	50V	elect
C249	1-121-409-00	Ⓐ 47	16V	elect
C250	1-101-924-00	Ⓐ 0.022		
C251	1-121-395-00	Ⓐ 4.7	25V	elect
C252	1-108-351-00	Ⓐ 0.0012		mylar
C253	1-102-936-00	Ⓐ 3p		
C254	1-108-352-00	Ⓑ 0.0018		mylar
C255	1-108-228-00	Ⓐ 0.0015		mylar
C256	1-102-807-00	Ⓐ 5p		
C257	1-102-947-00	Ⓐ 10p		
C258	1-101-924-00	Ⓐ 0.022		
C259	1-101-880-00	Ⓐ 47p		
C260	1-102-282-00	Ⓐ 8p		

Ref. No.	Part No.	Description		
C261	1-102-262-00	Ⓐ 12p		
C262	1-104-055-00	Ⓐ 120p		polyethylene
C263	1-104-065-00	Ⓐ 330p		polyethylene
C264	1-104-091-11	Ⓐ 0.0039		polyethylene
C266	1-121-391-00	Ⓐ 1	50V	elect
C267, 268	1-101-924-00	Ⓐ 0.022		
C401	1-121-915-00	Ⓐ 4.7	25V	elect
C402, 403	1-102-973-00	Ⓐ 100p		
C404	1-121-419-00	Ⓑ 220	6.3V	elect
C405	1-108-591-00	Ⓐ 0.033		mylar
C406	1-108-605-00	Ⓑ 0.12		mylar
C407	1-102-963-00	Ⓐ 33p		
C408, 451	1-121-915-00	Ⓑ 4.7	25V	elect
C452, 453	1-102-973-00	Ⓐ 100p		
C454	1-121-419-00	Ⓑ 220	6.3V	elect
C455	1-108-591-00	Ⓐ 0.033		mylar
C456	1-108-605-00	Ⓑ 0.12		mylar
C457	1-102-963-00	Ⓐ 33p		
C458	1-121-915-00	Ⓑ 4.7	25V	elect
C501, 551	1-108-234-00	Ⓐ 0.0047		mylar
C502, 552	1-121-391-00	Ⓐ 1	50V	elect
C503, 553	1-102-938-00	Ⓐ 1p		
C504, 554	1-108-228-00	Ⓐ 0.0015		mylar
C505, 555	1-108-249-00	Ⓐ 0.068		mylar
C506, 556	1-108-244-00	Ⓐ 0.033		mylar
C507, 557	1-108-357-00	Ⓐ 0.012		mylar
C508, 558	1-121-414-00	Ⓐ 100	10V	elect
C509, 559	1-102-820-00	Ⓐ 330p		
C510, 560	1-121-414-00	Ⓐ 100	10V	elect
C511, 561	1-102-965-00	Ⓐ 39p		
C512, 562	1-121-395-00	Ⓐ 4.7	25V	elect
C513, 563	1-123-192-00	Ⓐ 47	10V	elect
C514, 564	1-108-363-00	Ⓐ 0.12		mylar
C515, 565	1-108-357-00	Ⓐ 0.012		mylar
C516, 566	1-108-377-00	Ⓐ 0.01	100V	mylar
C517, 567	1-108-244-00	Ⓐ 0.033		mylar
C518, 568	1-108-361-00	Ⓐ 0.056		mylar
C519, 569	1-102-971-00	Ⓐ 82p		
C520, 570	1-121-726-00	Ⓐ 0.47	50V	elect
C521, 571	1-123-192-00	Ⓐ 47	10V	elect

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

- Circled letters (Ⓐ to Ⓩ) are applicable to European models only.

Ref. No.	Part No.	Description
		JACKS
J901, 904 J905, 951 J954, 955	1-507-430-XX	Ⓓ Pin Jack, 6P; PHONO, TAPE 1, REC OUT 1
J902, 903 J952, 953	1-507-532-00	Ⓒ Pin Jack, 4P; TAPE 2, REC OUT 2
J906	1-507-561-00	Ⓒ Jack, HEADPHONES
		MISCELLANEOUS
CNP901	⚠1-534-817-XX	Ⓓ Cord, power
F801, 802	⚠1-532-203-00	Ⓑ Fuse, 2AT
FE	1-463-248-00	Ⓛ Front-end
ME901	1-520-338-00	Ⓗ Meter, SIGNAL
ME902	1-520-339-00	Ⓗ Meter, FM TUNING
PL901,902	1-518-297-00	Ⓒ Lamp, pilot; 8V 300mA, DIAL
PL903	1-518-297-00	Ⓒ Lamp, pilot; 8V 300mA, METER
PL904 PL910	1-518-169-XX	Ⓑ Lamp, pilot; 4.5V 40mA
RY601	1-515-303-00	Ⓕ Relay
TM901,903 TM904	1-536-524-00	Ⓒ Terminal Board, 4P; ANTENNA, SPEAKER A, B
	1-518-317-00	Ⓖ Plate, reflection
	including;	
PL901,902	1-518-297-00	Ⓒ Lamp, pilot; 8V 300mA, DIAL

PACKING MATERIALS AND ACCESSORIES

Part No.	Description
1-501-184-00	Ⓒ Antenna, feeder
1-501-193-00	Ⓑ Antenna
3-701-630-00	Ⓐ Bag, polyethylene
3-770-599-11	Ⓓ Manual, instruction
4-809-251-00	Ⓐ Bag, polyethylene
4-847-802-11	Ⓐ Screw, case stopper
4-857-591-00	Ⓓ Carton
4-857-593-00	Ⓑ Cushion, upper
4-857-594-00	Ⓑ Cushion, lower

1/4 WATT CARBON RESISTORS Ⓐ

Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.
1.0	1-246-401-00	10	1-246-425-00	100	1-246-449-00	1.0k	1-246-473-00	10k	1-246-497-00	100k	1-246-521-00	1.0M	1-246-545-00
1.1	1-246-402-00	11	1-246-426-00	110	1-246-450-00	1.1k	1-246-474-00	11k	1-246-498-00	110k	1-246-522-00	1.1M	1-210-814-00
1.2	1-246-403-00	12	1-246-427-00	120	1-246-451-00	1.2k	1-246-475-00	12k	1-246-499-00	120k	1-246-523-00	1.2M	1-210-815-00
1.3	1-246-404-00	13	1-246-428-00	130	1-246-452-00	1.3k	1-246-576-00	13k	1-246-500-00	130k	1-246-524-00	1.3M	1-210-816-00
1.5	1-246-405-00	15	1-246-429-00	150	1-246-453-00	1.5k	1-246-577-00	15k	1-246-501-00	150k	1-246-525-00	1.5M	1-210-817-00
1.6	1-246-406-00	16	1-246-430-00	160	1-246-454-00	1.6k	1-246-578-00	16k	1-246-502-00	160k	1-246-526-00	1.6M	1-210-818-00
1.8	1-246-407-00	18	1-246-431-00	180	1-246-455-00	1.8k	1-246-579-00	18k	1-246-503-00	180k	1-246-527-00	1.8M	1-210-819-00
2.0	1-246-408-00	20	1-246-432-00	200	1-246-456-00	2.0k	1-246-580-00	20k	1-246-504-00	200k	1-246-528-00	2.0M	1-210-820-00
2.2	1-246-409-00	22	1-246-433-00	220	1-246-457-00	2.2k	1-246-581-00	22k	1-246-505-00	220k	1-246-529-00	2.2M	1-210-821-00
2.4	1-246-410-00	24	1-246-434-00	240	1-246-458-00	2.4k	1-246-582-00	24k	1-246-506-00	240k	1-246-530-00	2.4M	1-244-754-00
2.7	1-246-411-00	27	1-246-435-00	270	1-246-459-00	2.7k	1-246-583-00	27k	1-246-507-00	270k	1-246-531-00	2.7M	1-244-755-00
3.0	1-246-412-00	30	1-246-436-00	300	1-246-460-00	3.0k	1-246-584-00	30k	1-246-508-00	300k	1-246-532-00	3.0M	1-244-756-00
3.3	1-246-413-00	33	1-246-437-00	330	1-246-461-00	3.3k	1-246-585-00	33k	1-246-509-00	330k	1-246-533-00	3.3M	1-244-757-00
3.6	1-246-414-00	36	1-246-438-00	360	1-246-462-00	3.6k	1-246-586-00	36k	1-246-510-00	360k	1-246-534-00	3.6M	1-244-758-00
3.9	1-246-415-00	39	1-246-439-00	390	1-246-463-00	3.9k	1-246-587-00	39k	1-246-511-00	390k	1-246-535-00	3.9M	1-244-759-00
4.3	1-246-416-00	43	1-246-440-00	430	1-246-464-00	4.3k	1-246-488-00	43k	1-246-512-00	430k	1-246-536-00	4.3M	1-244-760-00
4.7	1-246-417-00	47	1-246-441-00	470	1-246-465-00	4.7k	1-246-489-00	47k	1-246-513-00	470k	1-246-537-00	4.7M	1-244-761-00
5.1	1-246-418-00	51	1-246-442-00	510	1-246-466-00	5.1k	1-246-490-00	51k	1-246-514-00	510k	1-246-538-00	5.1M	1-244-762-00
5.6	1-246-419-00	56	1-246-443-00	560	1-246-467-00	5.6k	1-246-491-00	56k	1-246-515-00	560k	1-246-539-00		
6.2	1-246-420-00	62	1-246-444-00	620	1-246-468-00	6.2k	1-246-492-00	62k	1-246-516-00	620k	1-246-540-00		
6.8	1-246-421-00	68	1-246-445-00	680	1-246-469-00	6.8k	1-246-493-00	68k	1-246-517-00	680k	1-246-541-00		
7.5	1-246-422-00	75	1-246-446-00	750	1-246-470-00	7.5k	1-246-494-00	75k	1-246-518-00	750k	1-246-542-00		
8.2	1-246-423-00	82	1-246-447-00	820	1-246-471-00	8.2k	1-246-495-00	82k	1-246-519-00	820k	1-246-543-00		
9.1	1-246-424-00	91	1-246-448-00	910	1-246-472-00	9.1k	1-246-496-00	91k	1-246-520-00	910k	1-246-544-00		

Sony Corporation

9-958-560-01

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Ref. No.	Part No.	Description		
C522, 572	1-121-403-00	Ⓐ 33	16V	elect
C523, 573	1-108-244-00	Ⓐ 0.033		mylar
C525	1-121-651-00	Ⓐ 10	16V	elect
C601	1-121-398-00	Ⓐ 10	25V	elect
C602	1-121-422-00	Ⓑ 220	25V	elect
C603	1-121-651-00	Ⓐ 10	16V	elect
C604	1-121-420-00	Ⓑ 220	10V	elect
C701–704	1-108-389-00	Ⓑ 0.1	100V	mylar
C705, 706 ⚠	1-125-157-00	Ⓓ 6800	42V	elect
C707, 708	1-121-261-00	Ⓑ 220	35V	elect
C709, 710	1-121-417-00	Ⓑ 100	25V	elect
C711	1-101-005-00	Ⓐ 0.022		
C712	1-121-415-00	Ⓐ 100	16V	elect
CP801 ⚠	1-108-750-00	Ⓑ 0.033	300V	mylar
CT201–206	1-141-171-00	Ⓑ Trimmer		

RESISTORS

All resistors are in ohms. Common ¼W carbon resistors are omitted. Refer to the list on the last page for their part numbers.

R202 ⚠	1-212-889-00	Ⓐ 220	¼W	fusible (nonflammable)
R215 ⚠	1-217-395-00	Ⓑ 47	¼W	fusible (nonflammable)
R233	1-244-860-00	Ⓐ 300	½W	carbon
R236 ⚠	1-217-399-00	Ⓑ 100	¼W	fusible (nonflammable)
R314–318	1-244-860-00	Ⓐ 300	½W	carbon
R518, 568 ⚠	1-212-982-00	Ⓐ 100	½W	fusible (nonflammable)
R519, 569 ⚠	1-212-897-00	Ⓐ 470	¼W	fusible (nonflammable)
R520, 570 ⚠	1-217-151-00	Ⓑ 0.22	2W	wirewound
R523, 573 ⚠	1-212-982-00	Ⓐ 100	½W	fusible (nonflammable)
R526, 576 ⚠	1-212-861-00	Ⓐ 15	¼W	fusible (nonflammable)
R527, 577 ⚠	1-212-897-00	Ⓐ 470	¼W	fusible (nonflammable)
R528, 578 ⚠	1-217-151-00	Ⓑ 0.22	2W	wirewound (nonflammable)
R531, 581, R533, 583 ⚠	1-212-958-00	Ⓐ 10	½W	fusible (nonflammable)
R534, 584 ⚠	1-211-626-00	Ⓑ 330	½W	fusible (nonflammable)
R602 ⚠	1-211-646-00	Ⓑ 2.2k	½W	carbon (nonflammable)
R604	1-244-873-00	Ⓐ 1k	½W	carbon
R701, 702 ⚠	1-211-548-00	Ⓑ 1.5k	¼W	carbon (nonflammable)
R703 ⚠	1-217-307-00	Ⓑ 56	5W	wirewound (nonflammable)
R704 ⚠	1-217-399-00	Ⓑ 100	¼W	fusible (nonflammable)
R705 ⚠	1-211-945-00	Ⓒ 2.2k	¼W	carbon (nonflammable)
R706 ⚠	1-217-399-00	Ⓑ 100	¼W	fusible (nonflammable)
RT202	1-224-645-XX	Ⓐ Adjustable, 10k (B); FM STEREO SEPARATION		
RT203	1-224-644-XX	Ⓐ Adjustable, 4.7k (B); MPX		
RT501,551	1-224-646-XX	Ⓐ Adjustable, 22k (B); DC BIAS		
RV1	1-226-339-00	Ⓕ Variable, 250k/250k/250k (B); VOLUME, BALANCE		
RV2	1-226-247-00	Ⓒ Variable, 250k/250k (W); TREBLE		
RV3	1-226-338-00	Ⓒ Variable, 100k/100k (C); BASS		

SWITCHES

S1	1-552-589-00	Ⓒ Lever-slide. FUNCTION
S2	1-552-556-00	Ⓒ Lever-slide, MONITOR
S3	1-552-599-00	Ⓕ Rotary-slide, band selector
S4	1-552-231-00	Ⓒ Lever-slide, MODE/(FM-AM MUTE)
S5	1-552-589-00	Ⓒ Lever-slide, LOUDNESS/ HIGH FILTER
S6 ⚠	1-552-601-00	Ⓕ Rotary-slide, POWER/ SPEAKERS
S7	1-552-233-00	Ⓑ Pushbutton, ANTENNA LW

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.